# PHYSICS

- 1. A student carries out an experiment and plots the V-I graph of three samples of
  - Nicrome wire with resistance  $R_1$ ,  $R_2$  and  $R_3$  respectively. Which ofeth following is true?
    - (A)  $R_1 = R_2 = R_3$
    - (B)  $R_1 > R_2 > R_3$
    - (C)  $R_3 > R_2 > R_1$
    - (D)  $R_2 > R_3 > R_1$
- 2. While doing their experiment on finding the equivalent resistance of two resistors connected in series, the students A, B and C set up their circuits as shown. The correct set up is that of:



- (A) Students A and B
- (C) Students C and A
- Commercial electric motors do not use: (A) An electromagnet to rotate the armature
  - (B) Effectively large no. of turns of conducting wire in the current carrying coil
  - (C) A permanent magnet to crate the armature
  - (D) A soft iron core on which the coil is wound
- 4. What is the angle of incidence when the incident ray is normal to the interface or boundary separating two media? (A)  $0^{\circ}$  (B)  $90^{\circ}$ 
  - (C) 180°

3.

(D)  $45^{\circ}$ 

(B)

(D)

Students B and C

All the three students

- 5. In an experiment with a rectangular glass slab, for an angle of incidence of  $60^{\circ}$  in air, angle of refraction is measured to be  $r_1$ . When the glass slab is replaced by a hollow slab filled with water, angle of refraction is measured to be  $r_2$ . Then:
  - (A)  $r_2 = r_1$  (B)  $r_2 > r_1$ (C)  $r_2 < r_1$  (D) Cannot say
- **6.** If angle of minimum deviation through an equilateral prism is 40°, angle of incidence (being equal to angle of emergence) would be:
  - (A) 50° (C) 40°

(B) 60°(D) None of these

7. A convex lens of focal length  $f_1$  is held in contact with a concave lens of focal length  $f_2$ . We cab find rough focal length of the combination only when:

(A)	$f_1 = f_2$	(B)	f <sub>1</sub> < f <sub>2</sub>
(C)	$f_1 > f_2$	(D)	None of these

- 8. An apple falls from a tree because of gravitation between the earth and apple. If  $F_1$  is the magnitude of force exerted by the earth on the apple and  $F_2$  is the magnitude of force exerted by apple on earth, then:
  - (A)  $F_1$  is very much greater than  $F_2$ (C)  $F_1$  is only a little greater than  $F_2$
- (B)  $F_2$  is very much greater than  $F_1$
- (D)  $F_1$  and  $F_2$  are equal

9. A body floats with  $\frac{1}{3}$  of its volume outside water and  $\frac{3}{4}$  of its volume outside another liquid. The density of the other liquid is:

(A)  $\frac{9}{4} \times 10^3 \text{ kg/m}^3$  (B)  $\frac{4}{9} \times 10^3 \text{ kg/m}^3$ (C)  $\frac{8}{3} \times 10^3 \text{ kg/m}^3$  (D)  $\frac{3}{4} \times 10^3 \text{ kg/m}^3$ 



- 10. A hydrometer floats with half of its stem outside water surface. It is now placed in alcohol (R.D = 0.8). The hydrometer floats:
  - (A) with stem at the same position
  - (C) with more stem outside alcohol

- (B) with more stem inside the alcohol
- (D) in tilted pos8ition
- 11. A key of a mechanical piano is struck gently and then struck again but much harder this time. In the second case:
  - (A) Sound will be louder but pitch will not be different
  - (B) Sound will be louder and pitch will also be higher
  - (C) Sound will be louder but pitch will be lower
  - (D) Both loudness and pitch will remain unaffected
- 12. The intensity of sound wave gets reduced by 20% on passing through a slab. The reduction in intensity on passing through two consecutive slabs is:
  - (A) 40%
  - (C) 30%

(B) 36% (D) 50%

- CHEMISTRY
- 13. A dilute Ferrous sulphate solution was gradually added to the beaker containing acidified Permanganate solution. The light purple colour of the solution fades and finally disappears. Which of the following is the correct explanation for the observation?
  - (A) KMnO<sub>4</sub> is an oxidizing agent, it oxidizes FeSO<sub>4</sub>
  - (B) FeSO<sub>4</sub> acts as an oxidizing agent and oxidizes KMnO<sub>4</sub>
  - (C) The colour disappears due to dilution: no reaction is involved
  - (D) KMnO<sub>4</sub> is an unstable compound and decomposes in presence of FeSO<sub>4</sub> to a colourless compound
- In the double displacement reaction between aqueous potassium iodide and aqueous lead nitrate, a vellow 14. precipitate of lead iodide is formed. While performing the activity if lead nitrate is not available, which of the following can be used in place of lead nitrate?
  - (A) Lead sulphate (insoluble)
  - (C) Ammonium nitrate

(B) Lead acetate (D) Potassium sulphate

(B) Dilution of an acid

(D) Sublimation of Camphor (Crystals)

- Which of the following are exothermic processes? 15.
  - (A) Reaction of water with quick lime
  - (C) Evaporation of water
  - 1.(a) and (b)
  - 2.(b) and (c)
  - 3.(a) and (d)
  - 4.(c) and (d)
- If a few drops of a concentrated acid accidently spill over the hand of a student, what should be done? 16. (A) Wash the hand with saline water
  - (B) Wash the hand immediately with plenty of water and apply a paste of sodium hydrogen carbonate
  - (C) After washing with plenty of water apply solution of sodium hydroxide on the hand
  - (D) Neutralise the acid with a strong alkali
- Which of the following is acidic in nature? 17.
  - (A) Lime juice
  - (C) Lime water

(C) A, D, E

- (B) Human blood
- (D) Antacid
- 18. Which of the following represent saponification reaction?
  - (A)  $CH_3COONa + NaOH \xrightarrow{CaO} + Na_2CO_3$ 
    - (B)  $CH_3COOH + C_2H_5OH \longrightarrow CH_3COOC_2H_5 + H_2O$
    - (C)  $2CH_3COOH + 2Na \rightarrow CH_3COONa + H_2$
    - (D)  $CH_3COOC_2H_5 + NaOH \rightarrow CH_3COONa + C_2H_5OH$
- 19. Hard water does not easily produce lather with soap because it contains:

  - (A) Only  $Mg^{2+}$  ions (C) Both  $Mg^{2+}$  and  $Ca^{2+}$  ions (B) Only  $Ca^{2+}$  ions (D) Both Na<sup>+</sup> and K<sup>+</sup> ions
- 20. Which of the given element A, B, C, D and E with atomic number 2, 3, 5, 7, 10 and 30 respectively belong to the same period? (A) A, B, C

(B)	B, C,	C
(D)	B, D,	E

(B) Heterogeneous and does not show Tyndall effect

(D) Homogeneous and does not show Tyndall effect

- 21. A mixture of sulphur and carbon disulphide is: (A) Heterogeneous and shows Tyndall effect
  - (C) Homogeneous and shows Tyndall effect
- 22. Which of the following contains maximum number of molecules?
  - (A) 1 gm of  $CO_2$
  - (C) 1 gm of H<sub>2</sub>

- (B) 1 gm of N<sub>2</sub> (D) 1 gm of CH<sub>4</sub>
- 23. Which of the following correctly represent 360 gms of water?
  - (i) 2 moles of H<sub>2</sub>O
  - (ii) 20 moles of water
  - (iii)  $6.022 \times 10^{23}$  molecules of water
  - (iv)  $1.2044 \times 10^{25}$  molecules of water
  - (A) (i)
  - (C) (ii) and (iii)

# BIOLOGY

- 24. Which one of the following is not an Annelid?
  - (A) Nereis
  - (C) Leech

25. If salivary amylase is lacking in the saliva, which of the following functions in mouth cavity will be affect?

- (A) Proteins breaking down into amino acids
- (B) Starch breaking down into sugars
- (C) Fats breaking down into fatty and gyvcerol
- (D) None of these
- 26. Reproduction is essential for living organisms in order to:
  - (A) Keep the individual organism alive
  - (B) Fulfil their energy requirements
  - (C) Maintain growth
  - (D) Continue the species generation after generation

A cross between a tall plant (TT) and short pea plant (tt) resulted in progeny that were all tall plants because: 27.

(A) Tallness is recessive trait

- (B) Tallness is dominant trait (D) All of these
- (C) Dwarfness is dominant trait
- 28. According to evolutionary theory, formation of new species is due to:
  - (A) New needs and changes in environmental conditions
  - (B) Sudden change in climatic conditions
  - (C) Accumulation of variations over several generations
  - (D) Inheritance of acquired characteristics
- 29 Which is correct sequence of air passage during inhalation?
  - (A) Nostrils  $\rightarrow$  Larynx  $\rightarrow$  Pharynx  $\rightarrow$  Trachea  $\rightarrow$  Lungs
  - (B) Nasal Passage  $\rightarrow$  Trachea  $\rightarrow$  Pharynx  $\rightarrow$  Larynx  $\rightarrow$  Alveoli
  - (C) Larynx  $\rightarrow$  Nostrils  $\rightarrow$  Pharynx  $\rightarrow$  Lungs
  - (D) Nostrils  $\rightarrow$  Pharynx  $\rightarrow$  Larynx  $\rightarrow$  Trachea  $\rightarrow$  Alveoli
- 30. If testa is removed from water soaked gram seed, the remaining structure is:
  - (A) Full mature embryo
  - (C) Cotyledons filled with starch
- (B) Cotyledons with endosperm
- (D) Half mature embryo
- 31. Which of the following statement is incorrect?
  - (A) For every hormone there is a gene
  - (C) For production of every enzyme there is a gene
- (B) For every protein there is a gene
- (D) For every molecule of fat there is a gene
- 32. Some dinosaurs had feathers although they could not fly but birds have feathers that help them to fly. In the context of evolution this means that:
  - (A) reptiles have evolved from birds
  - (B) there is no evolutionary connection between reptiles and birds
  - (C) feathers are homologous structures in both the organisms
  - (D) birds have evolved from reptiles

- (B) (i) and (iv) (D) (ii) and (iv)
- (B) Earthworm (D) Urchin

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- 33. Excessive exposure of human to UV rays results in:
  - Damage to immune system (i)
  - Damage to lungs (ii)
  - (iii) Skin cancer
  - (iv) Peptic Ulcers
  - (A) (i) and (ii)
  - (C) (i) and (iii)

(B) (ii) and (iv) (D) (iii) and (iv)

(B) Stomata

(D) Suberin

- 34. Making antiviral drugs is more difficult than making anti bacterial medicines because:
  - (A) Viruses make use of host machinery
  - (B) Viruses are on the border line of living and nonliving
  - (C) Viruses have very few biochemical mechanisms of their own
  - (D) Viruses have a protein coat
- 35. In desert plants, rate of water loss gets reduced due to the presence of:
  - (A) Cuticle
  - (C) Lignin
- SOCIAL SCIENCE
- 36. The term "Tavern" stands for a:
  - (A) Place where people gathered to dance and dine
  - (B) Place where people carried political discussions
  - (C) Place where people gathered to drink alcohol
  - (D) Place where people gathered to discuss their problems
- "When France sneezes, the rest of Europe catches cold", who remarked these words? 37. (A) Duke Metternich
  - (C) Otto Von Bismarck
- 38. The Tripartite Pact (1940) was signed by:
  - (A) Britain, France and Germany
  - (C) Japan, Britain and Russia
- 39. Philanthropsis mainly work for:
  - (A) industrial workers
  - (C) social and religios reforms
- 40. The Vernacular Press Act (1878) was prepared to:
  - (A) provide the government with right to censor reports and editorials
  - (B) provide the government with rights to promote vernacular press
  - (C) provide the government with right to favour Indian vernacular press for growth of nationalism
  - (D) provide the government with rights to finance vernacular press
- 41 "Civil Code of 1804: is usually known as:
  - (A) Habsburg Code
  - (C) Germanic Code
- 42. Which leader is known as the Frontier Gandhi? (A) M.K. Gandhi
  - (C) Abdul Ghaffar Khan
- 43. Raikas tribe is found in:
  - (A) Madhya Pradesh
  - (C) Jharkhand
- Which of the following is not included in the teachings of Jainism? 44.
  - (A) Fasts and mortification for the body
  - (C) Non-violence
- 45. The Upanishads are:
  - (A) A source of Hindu philosophy
  - (C) Books on social behavior man
- 46. Indian Constitution Federation from:
  - (A) USA
    - (C) Australia

- (B) Napolenoic Code
- (D) Dutch Code
- (B) Indira Gandhi
- (D) J.L. Nehru
- (B) Arunanchal Pradesh
- (D) Rajasthan
  - (B) Belief in Karma and rebirth
  - (D) Belief in God
  - (B) Books of ancient Hindu law
  - (D) Prayers to god
  - (B) Canada
  - (D) England

Germany, Italy and Japan (B) (D) Russia, Britain and USA

(B) Giuseppe Mazzini

Frederic Sorrieu

peasants (B)

(D)

- (D) social uuliftment and charity

- 47. Water privitisation protest in Bolivia was led by: (A) Student union
  - (C) Political Parties
- 48. Universal Adult Franchise was firstly granted in:
  - (A) Germany
  - (C) Newzealand
- 49 In a parliamentary form of democracy:
  - (A) Executive controls the Legislature
  - (C) Judiciary controls the Executive
- 50 Which of the following locations is not correct?

(B) Fedecor

- (D) Labour Union
- (B) USA
- (D) Britain
- (B) Executive Controls the Judiciary
- (D) Legislature controls the Executive

Name of the organization	Location of Headquarter
(A) UNESCO	Paris
(B) ILO	Geneva
(C) FAO	Brussels
(D) International Court of Justice	the Hague

- 51. Which of the following statements about the international Court of justice is not correct?
  - (A) It is the principal judicial organ of the United Nations
  - (B) Its judges are elected
  - (C) Its decisions are not enforceable
  - (D) Nations aggrieved by the non-implementation of the decision have no further redress
- 52. The civil Court does not deal with:
  - (A) Land disputes
  - (C) Offence like thefts

- (B) Landloard tenant disputes
- (D) None of these
- In the context of Panchayati Raj, which one of the following is true about Gram Sabha? 53.
  - (A) This is the topmost tier of the Panchayati Raj
  - (B) It consists of all the vboters residing in the jurisdiction of a village panchayat
  - (C) It is executive body consisting of selected representatives from the village panchayat
  - (D) It consists of all about males of the village panchayat
- 54. Eligibility for a regional party to be recognized as a national party is:
  - (A) To be recognized in at least 3 states
  - (B) Recognized in at least 4 states
  - (C) To get 1/10<sup>th</sup> of the seats of Lok Sabha
  - (D) Get 1/10<sup>th</sup> seats of Parliament
- 55. What is Zero Hour?
  - (A) When matters of utmost importance are raised
  - (B) When a money bill is introduced in the Lock Sabha
  - (C) when session became zero
  - (D) At 12°o clock
- Irrigation facilities should be improved urgently in India because: 56.
  - (A) irrigation yields better output

- (B) monsoon is irregular
- (C) rivers are dry most of the periods in the year
- (D) land under irrigation is small
- 57. Maharashtra state is ideal for cotton cultivation because:
  - (A) it has a good network of communication
  - (B) it has sticky black soil
  - (C) it provides cheap and abundant labour
  - (D) it has a moderate climate
- 58. Why is there scanty rainfall in the Deccan Plateau?
  - (A) It is far away from the sea
  - (C) It is in the rain shown region

- (B) It is near the sea (D) None of these
- 59. Flood occur frequently in the northern plains of India because of:
  - (A) Long spells of rainy weather
  - (B) the presence of many large river courses
  - (C) Fluctuation of the level of the understand water table
  - (D) Uncertain and uneven occurrence of rains in the plains



- (A)  $d = r_1 r_2$ (B)  $d = r_1 + r_1$ (D)  $d = \sqrt{r_1 r_2}$
- **73.** In an equilateral triangle ABC if AD  $\perp$  BC, then:

(A)  $2AB^2 = 2AD^2$ 

(C) 3AB<sup>2</sup> = 4AD<sup>2</sup>

(B)  $4AB^2 = 3AD^2$ (D)  $2AB^2 + 2AD^2$  74. The ratio of the length of a side of an equilateral triangle and its height is:

(A)	2:1	(B)	1:2
(C)	2:√3	(D)	√3:2

- **75.** There are four lines in a plane no two of which are parallel. The maximum number of points in which they can intersect is:
  - (A) 4 (B) 5 (C) 6 (D) 7
- **76.** A balloon of radius r makes an angle  $\alpha$  at the eye of an observer and the angle of elevation of its centre is  $\beta$ . The height of its centre from the ground level is given by:
  - (A)  $r \cos \frac{\beta}{2} \sec \alpha$
  - (C)  $r \sin \frac{\alpha}{2} \csc \beta$

(D)  $r \sin\beta \csc \frac{\alpha}{2}$ 

(B)  $r \cos\beta \sec \frac{\alpha}{2}$ 

- **77.** From the top of a light house the angles of depression of two ships on the opposite sides of it are the observed to be  $\alpha$  and  $\beta$ . If the height of the light house be h meters and the line joining the ships passes through the foot of the light house, the distance between the ships is:
  - (A)  $\frac{h(\cot\alpha + \cot\beta)}{\cot\alpha . \cot\beta}$
  - (C)  $h(\tan \alpha + \tan \beta)$

(B)  $\frac{h(\tan \alpha + \tan \beta)}{\tan \alpha \cdot \tan \beta}$ (D)  $\frac{h \tan \alpha \cdot \tan \beta}{\tan \alpha \cdot \tan \beta}$ 

- **78.** A boat is being rowed away from a cliff 150 m high. At the top of the cliff the angle of depression of the boat changes from  $60^{\circ}$  to  $45^{\circ}$  in 2 minutes. The speed of the boat is:
  - (A) 2 km/hr
     (B) 1.9 km/hr

     (C) 2.4 km/hr
     (D) 3 km/hr
- **79.**  $\frac{\cot A + \csc A 1}{\cot A \csc A + 1}$  is equal to
  - (A) cosec A + cot A
     (B) sec A + cot A

     (C) cosec A + tan A
     (D) cosec A cot A
- **80.** A bag contains 5 blue and 4 black balls. Three balls are drawn at random. What is the probability that 2 are blue and 1 is black?
  - (A)  $\frac{1}{3}$ (C)  $\frac{1}{6}$  (B)  $\frac{2}{5}$ (D) None
- 81. How many terms of the A.P. 3, 6, 9, 12, 15.....must be taken to make the sum 108? (A) 6 (B) 7 (C) 8 (D) 36

82. If V be the volume and S the surface area of a cuboid of dimensions a, b and c, then  $\frac{1}{V}$  is equal to:

(A)  $\frac{S}{2}(a+b+c)$ (C)  $\frac{2S}{a+b+c}$ 

**83.** The area of a circular ring between two concentric circles of radii r and (r + h) units respectively is given by: (A)  $\pi$  (2r + h) h sq. units (B)  $\pi$  (r + h) h sq. units

(C)  $\pi$  (r + 2h) r sq. units

(D)  $\pi$  (r –h) r sq. units

 $\frac{2}{S}\left(\frac{1}{a}+\frac{1}{b}+\frac{1}{c}\right)$ 

(D) 2S(a+b+c)

84. A man can row three quarters of a km against the stream in  $11\frac{1}{4}$  minutes and return in  $7\frac{1}{2}$  minutes. The speed

of the man in still water is:

(A) 2 km/h

(C) 4 km/h

(B) 3 km/h

(B)

(D) 5 km/h

- 85. A tank can be filled by one tap in 209 minutes and by another in 25 minutes. Both the taps are kept open for 5 minutes and then the second is turned off. In how many minutes more is the tank completely filled?
   (A) 6
   (B) 11
  - (C) 12 (D)  $17\frac{1}{2}$
- 86. The solution set of the equation  $x^{2/3} + x^{1/3} 2 = 0$  is (A) {8, 1} (C) {-8, -1} (D) {-8, 1}

87. The roots of the equation  $x^2 + px + q = 0$  are 1 and 2. The roots of the equation  $qx^2 - px + 1 = 0$  must be: (A) 1, 1/2 (B) -1/2, -1(C) -1/2, 1 (D) -1, 1/2

**88.** The solution of the equations:

$\frac{m}{x}$ +	$\frac{n}{y} = a, \frac{n}{x} + \frac{m}{y} = b$ is given by
(A)	$=\frac{n^2+m^2}{am-bn}, y=\frac{m^2-n^2}{bm-an}$
(C)	$x = \frac{m^2 - n^2}{am - bn}, y = \frac{m^2 - n^2}{bm - an}$

- 89. The HCF of two expressions p and q is 1. Their LCM is:
  (A) p + q
  (B) p 1
  - (C) pq
- (D)  $\frac{1}{pc}$
- **90.** If x –a is a factor of  $x^3 3x^2a + 2a^2x + b$  then the value of b is:
  - (A) 0 (C) 1

(B) 2 (D) 3 m

a

am-bn

bm-an

bm-an

(B)

(D)

# SCHOLASTIC APTITUDE TEST-2014

ANSWER					
SECTION - 1: PHYSICS	S				
1. C	2. B	3. C	4. A	5. B	
6. A	7. A	8. D	9. C	10. B	
11. A	12. B			4450/	8
				121 62	
SECTION - 2: CHEMIS	TRY				
			- 1	1 9 1	
13. A	14. B	15. A	16. B	17. A	
18. D	19. C	20. B	21. A	22. C	
23. D			6 1 3		
SECTION - 3: BIOLOG	Y	P			
24. D	25. B	26. D	27. B	28. C	
29. D	30. B	31. D	32. D	33. C	
34. C	35. A	22102	mail		
		46	1		
SECTION - 4: SOCIAL	SCIENCE	46			
36.C	37.A	38.B	39.D	40.A	
41.B	42.C	43.D	44.D	45.A	
46.B	47.D	48.C	49.D	50.C	
51.C	52.C	53.B	54.B	55.D	
56.D	57.B	58.A	59.B	60.A	
61.B	62.C	63.D	64.D	65.B	
66.D	67.D	68.D	69.D	70.B	
2					
SECTION - 5: MATHEN	MATICS				
71. B	72. C	73. C	74. C	75. C	
76. D	77. B	78. B	79. A	80. D	
81. C	82. B	83. A	84. D	85. B	
86. D	87. B	88. C	89. C	90. A	
	/ ···· -				
4 10/					
1					

### SOLUTIONS

## **PHYSICS**

- **1.** Slope of I–V graph =  $\frac{1}{R}$  = tan $\theta$ . Slope is less for R<sub>3</sub>, so option three is correct.
- 2. For figure a R<sub>2</sub> is parallel with ideal wire so the circuit will not work.
- 3. Permanent magnets are weak.
- **4.** Incidence ray is along the normal so  $i = 0^{\circ}$
- 5. Refractive index of water is less than that of glass. So angle of refraction will be more for water.
- **6.** For minimum deviation i = e

 $a + \delta_m = i + e$  $a + \delta_m = 2i$  $60^\circ + 40^\circ = 2i$  $i = 50^\circ$ 

- 7. For rough focal length, we assume parallel incidence beam and it emerges out parallel. The combination will behave as a slab.
- 8. Action and reaction have equal magnitude.

9. 
$$mg = \rho_w \frac{2v}{3}g = \rho_\ell \frac{v}{4}g$$
$$\rho_\ell = 100 \times \frac{2}{3} \times 4$$

- **10.** The density of alcohol (800 kg/m<sup>3</sup>) is less than that of water. So hydrometer will dip more than earlier.
- **11.** For a particular key there is fixed frequency.
- 12. Let initial intensity is I. On first passes the intensity loss will be20% of I. So  $I_1 = 0.8$  I. On second passage the loss will be 20% of 0.8 I.

 $\frac{20}{100} \times \frac{8}{10} | = 0.16|$ So the final intensity will be 0.8 I - 0.16 I = 0.64 I So loss will be  $\frac{0.64I - I}{I} \times 100$ 36%

# CHEMISTRY

- 13. In KMnO<sub>4</sub> oxidation state of Mn is +7. So it is a powerful oxidizing agent.
- 14.  $(CH_3COO)_2 Pb + 2KI \rightarrow PbI_2 + 2CH_3COOK$
- 15. Addition of quick lime to water and dilution of acid are examples of exothermic reactions.
- **16.** NaHCO<sub>3</sub> is added to neutralize acid.
- **17.** Lime juice has pH < 7.
- **18.** Alkaline hydrolysis of ester is called saponification.
- **19.** Hard water contains  $Mg^{2+}$  and  $Ca^{2+}$  ions.
- 20. Li, N and Ne belong to same period.
- 21. It is a fact
- **22.** Mole of  $H_2 = \frac{1}{2}$ , which is maximum.
- **23.** Number of moles of  $H_2O = \frac{360}{18} = 20$

## **BIOLOGY**

- 24. Sea Urchin belongs to phylum echinodermata.
- 25. Salivary amylase is required for breakdown of starch into maltose.
- 26. Reproduction is required for multiplication of organisms thereby maintaining continuity of species.
- 27. Tallness is a dominant trait in pea plant, so a cross between TT and tt plant will always result in all tall plants.
- **28.** Continuous accumulation of variation among organisms leads to formation of new species and helps in evolution.
- **29.** During inhalation, air moves from the outermost structure of respiratory tract nostril to pharynx then larynx, trachea and then alveoli.
- 30. Testa is the outermost covering of seed coat, behind which is present cotyledons filled with endosperm
- **31.** Proteins, enzymes and proteinicious hormones are produced through gene.
- 32. Presence of feathers that help birds fly shows that birds have evolved later on after reptiles.
- 33. Harmful U.V rays are sufficient enough to cause skin cancer and damage the immune system of human body.
- **34.** Viruses completely depend upon host organisms for their multiplication and they don't have any biochemical mechanisms that can be acted upon by antiviral drugs.
- 35. Cuticle is the outermost covering in the stem of desert plants which helps in preventing water loss.

# MATHEMATICS

- 71. Area =  $\frac{\sqrt{3}}{4} (6)^2 3 \times \frac{60}{360} \pi (3)^2$
- **72.** d = r<sub>1</sub> r<sub>2</sub>

**73.** 
$$AB^2 + AC^2 = 2[AD^2 + BD^2]$$

$$AB^2 + AB^2 = 2 \left| \frac{AB^2}{4} + BD^2 \right|$$

74. Let side3 = a

Height = 
$$\frac{\sqrt{3}}{2}$$
a

**75.** Number of points of intersection  $4_{c_2} = \frac{4 \times 3}{2} = 6$ 

**76.**  $\frac{1}{2} = \sin \theta$ 



- **78.**  $\frac{1}{1000} \left( 150 \frac{150}{\sqrt{3}} \right) = v \times \frac{2}{60}$
- 79. Multiply number of direction by cot A + cosec A + 1

80. P = 
$$\frac{{}^{5}C_{2} \times {}^{4}C_{1}}{{}^{9}C_{3}}$$

**81.**  $\frac{n}{2} [2.3 + (n-1)3] = 108$ 

6n + 3n<sup>2</sup> - 3n = 216 3n<sup>2</sup> + 3n - 216 = 0 x<sup>2</sup> + n - 72 = 0 (x + 9) (x - 8) = 0x = 8

**82.** v = abc; s = 2(ab + bc + ac)

$$\frac{s}{v} = 2\left(\frac{1}{a} + \frac{1}{b} + \frac{1}{c}\right)$$

**83.** A = 
$$\pi$$
 (r + h)<sup>2</sup> –  $\pi$  r<sup>2</sup>

84. Let +  $v_m$  = velocity of man  $V_s$  = velocity of stream

$$\frac{3}{4} = (v_{m} - v_{s})\frac{45}{4} \times \frac{1}{60}$$
$$\frac{3}{4} = (v_{m} + v_{s})\frac{15}{2} \times \frac{1}{60}$$

**85.** Let flow rate of first tank = x m<sup>3</sup>/min. Flow rate of  $2^{nd}$  tap = ym<sup>3</sup>/min. Let volume of tank = m<sup>3</sup>

$$x = \frac{v}{20}$$

$$Y = \frac{v}{25}$$
$$5t = \frac{v - 5x - 5y}{25} = 11 \text{ min}$$

86. Put 
$$x^{1/3}$$
 t  
 $t^2 + t - 2 = 0$   
 $(t + 2) (t - 1) = 0$   
 $t = 1, t = -2$   
 $x^{\frac{1}{3}} = 1$   $x^{1/3} = -2$   
 $x = 1$   $x = -8$ 

-3

87. P =

q = 2 Now equation is  $2x^2 + 3x + 1 = 0$  $2x^2 + 2x + x + 1 = 0$ (2x + 1) (x + 1) = 0

- 89. HCF of P and Q = 1 So LCM = PQ
- **90.** x = a is rootSo  $a^3 - 3a^3 + 2a^3 + b = 0$ B = 0

#### **Directions for Questions 1 to 5:**

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Arrange the given words in the sequence in which they occur in the dictionary and then choose the correct sequence from the options.



Select the combination of numbers so that letters arranged accordingly will form a meaningful word.

6.	B L I P U S H 1 2 3 4 5 6 7 (1) 4, 5, 1, 2, 6, 3, 7 (3) 1, 2, 3, 4, 5, 6, 7	(2) (4)	4, 5, 3, 2, 1, 6, 7 4, 5, 1, 2, 3, 6, 7
7.	H L R A O C S 1 2 3 4 5 6 7 (1) 1, 2, 3, 4, 5, 6, 7 (3) 7, 6, 1, 5, 2, 4, 3	(2) (4)	7, 6, 5, 1, 4, 2, 3 7, 6, 5, 1, 2, 4, 3
8.	I K E S R T 1 2 3 4 5 6 (1) 6, 4, 5, 1, 2, 3 (3) 6, 5, 4, 3, 2, 1	(2) (4)	4, 6, 5, 1, 2, 3 1, 2, 3, 4, 5, 6
9.	M BL A L R U E 1 2 3 4 5 6 7 8 (1) 7, 1, 2, 6, 8, 3, 5, 4 (3) 8, 7, 2, 1, 4, 5, 3, 6	(2) (4)	1, 2, 3, 4, 5, 6, 7, 8 1, 2, 3, 6, 7, 8, 4, 5

1

RGOSIEAN		
1 2 3 4 5 6 7 8		
(1) 3, 8, 7, 4, 5, 6, 1, 2	(2)	3, 2, 1, 5, 8, 7, 4, 6
(3) 3, 1, 2, 8, 7, 4, 5, 6	(4)	3, 1, 2, 7, 8, 5, 4, 6
	R G O S I E A N 1 2 3 4 5 6 7 8 (1) 3, 8, 7, 4, 5, 6, 1, 2 (3) 3, 1, 2, 8, 7, 4, 5, 6	R G O S I E A N         1 2 3 4 5 6 7 8         (1) 3, 8, 7, 4, 5, 6, 1, 2         (3) 3, 1, 2, 8, 7, 4, 5, 6         (4)

### Directions for Questions 11 to 15:

Some words are given in Column–I. These words are written in a code language in Column-II. The code equivalents of the words given in Columns-I are II are not necessarily in the corresponding order. Choose the correct code for the words from the given alternatives.

(2) na(4) per

(2) sa

(4)

(2) tan

(4)

(2) per

(4) tan

(2) tan

(4) sa

tan

na

S.No.	Column–I	Column–II
(i)	Podnajoc	very bright boy
(ii)	tan nu pod	the boy comes
(iii)	nu per ton	keep the doll
(iv)	joc ton su	very good doll
(V)	sa pod ton	doll is boy

<sup>11.</sup> Which word will be code for word doll?

- (1) ton
- (3) joc
- **12.** Which word will be code for boy?
  - (1) nu
  - (3) pod
- **13.** Which word will be code for word bright?
  - (1) pod
  - (3) nu
- 14. Which word will be code for word keep?
  - (1) joc
  - (3) pod
- 15. Which word will be code for word the?
  - (1) nu
  - (3) per

# Directions for Questions 16 to 20:

There are three words. The first two words to the left of (::) are related in some way. The same relationship holds between the third word to the right of sign (::) and one of the responses. Identify the correct related word.

16.	Newspaper : Editor : : Film :? (1) Actor (3) Director	(2) (4)	Producer Story Writer
17.	Calendar : Dates : : Dictionary :? (1) Language (3) Grammar	(2) (4)	Sentences Vocabulary
18.	Rupee : India : : Yes :? (1) Pakistan (3) Bangladesh	(2) (4)	Japan Nepal
19.	Dog : Bark : : Goat :? (1) Bleat (3) Grunt	(2) (4)	Howl Bray
20.	<ul><li>Animals : Zoology : : Birds :?</li><li>(1) Botany</li><li>(3) Ornithology</li></ul>	(2) (4)	Philology Siesmology

#### Directions for Questions 21 to 25:

Choose the correct options.

(1) HOHYBJBA

(3) FOHYZJBB

- 21. As COUNSEL is to BITIRAK, so also GUIDANCE is to:
  - (2) FPHZZKAB
    - (4) OHYZKBB
- **22.** As BLOCKED is to YOLOXPVW, so also OZFMXS is to:
  - (1) LABOUR(2) LAUNCH(3) NAUGHT(4) RESULT
- **23.** As THEREFORE is to TEEOERFRH, so also HELICOPTER is to:
  - (1) RETPOCILNE
    - (3) HLCPERTOIE

- (2) RETPOCILEH(4) HELICORETP
- **24.** As RATIONAL is to RATNIOLA, so also TRIBAL is to:
  - (1) TRILBA
  - (3) TRIALB

- (2) TIRLBA(4) TIRLAB
- **25.** As CIRCLE is to RICELC, so also SQUARE is to:
  - (1) UQSERA(3) QUSERA

(2) UQSAER (4) QSUERA

Directions for Questions 26 to 30:

They are based on the following information  $\alpha, \beta, \gamma, \delta, \varepsilon, \phi, \psi, \eta$  are sitting on a merry-go-round facing at the center.  $\delta$  is second to the left on  $\eta$  who is third to the left of  $\alpha, \beta$  is fourth to the right of  $\gamma$  who is immediate neighbour of  $\beta$  or  $\gamma$  is not a neighbor of  $\beta$  or  $\gamma, \phi$  is not a neighbor of  $\beta$ .

(2)

(4) ψ

γ

(2) β, ε

(4) ψ, η

- **26.** Who is third to the left of  $\beta$ ?
  - (1) α
  - (3)

27. In which of the following pairs is the first person sitting to the immediate right of the second person?

- (1) δ, ψ
- (3) η, β
- **28.** What is  $\phi$ 's position with respect to  $\psi$ ?
  - (1) Third towards right
  - (3) Second towards right
- **29.** Who is sitting between  $\alpha$  and  $\beta$ ?
  - (1) Both  $\epsilon$  and  $\eta$
  - (3) Only ε
- **30.** How many of them are sitting between  $\gamma$  and  $\beta$ ?
  - (1) 0 or 6 (3) 2 or 4

- (2) Third towards left
- (4) Second towards left
- (2) Both  $\phi$  and  $\gamma$
- (4) Only  $\gamma$
- (2) 1 or 5
- (4) 3

# Directions for Questions 31 to 35:

You are given a figure (X) followed by four figures 1, 2, 3 and 4 such that (X) is embedded in one of them. Trace out the correct alternative.





**Directions for Questions 36 to 45:** Find out which of the answer figures 1, 2, 3, and 4 completes the figure matrix.







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45.





#### Directions for Questions 46 to 50:

You are given a combination of letters and numbers followed by four alternatives 1, 2, 3, and 4. Choose the alternative that most closely resembles the mirror image (can be horizontal or vertical or both) of the given combination.

	-
	6
-	О.
	•••

# REASONING

1.	GUINOSABK	2.	REASONING
з.	GNINOS∀ER	4.	GNINOSAER

#### 47.

WESTERN						
1.	WESTERN	2.	WESTEKN			
З.	WESTERN	4.	MESTERN			

# 48.

# **DBV8478**

1.	B74478	2.	8748VBD	ß
3.	8478DBV	4.	<b>DBA8478</b>	Ę

# 49.

15UP5062	*
1. 5062UP15	2. 2605PN51
15UP5065 .E	4. None of these

# 50.

# panipat

1.	tapinap	2.	aap	
3.	panipat	4.	pat	



- tapir
- pani

ANSWERS



#### SOLUTION

- 1. The given words can be arranged in the alphabetical order as: Christmas→Chronic→Cinema→Cloth→Create
- 2. The given words can be arranged in the alphabetical order as: Diagnose→Diagram→Dial→Dialogue→Diameter
- 3. The given words can be arranged in the alphabetical order as: Narrow→Nation→National→Naughty→Navigate
- 4. The given words can be arranged in the alphabetical order as: Pedestrian→Peerless→Penal→Pharmacy→Petroleum
- 5. The given words can be arranged in the alphabetical order as: Unsafe $\rightarrow$ Unseat $\rightarrow$ Unshared $\rightarrow$ Unship $\rightarrow$ Unstable
- 6. The given words on rearranging the letters PUBLISH
- 7. The given words on rearranging the letters SCHOLAR
- 8. The given words on rearranging the letters STRIKE
- 9. The given words on rearranging the letters UMBRELLA
- 10. The given words on rearranging the letters ORGANISE
- 11. According to the given question the code for the word Doll = ton
- 12. According to the given question the code for the word Boy = pod
- 13. According to the given question the code for the word Bright = na
- 14. According to the given question the code for the word Keep = per
- 15. According to the given question the code for the word The = nu
- 16. Head of the newspaper is editor similarly head of the film is director.
- 17. We see dates in calendar similarly we see vocabulary in dictionary
- 18. 'Rupee' is the currency of 'India'. Similarly, 'yen' is the currency of 'Japan'.
- 19. Second is noise produced by the first.
- 20. Study of animal is Zoology Similarly study of birds is Ornithology
- 21. The pattern is as follows: -1, -6, -1, -5, -1, -4



- 22. The pattern is as follows: B L O C K E D 25 15 12 24 16 22 23 Reverse value Y O L X P V W Similarly the code for O Z F M X S 12 1 21 14 3 8 Reverse value L A U N C H
- 23. The pattern is as follows: 1 2 3 4 5 6 7 8 9 = 1 3 5 7 9 8 6 4 2 T H E R E F O R E = T E E O E R F R H Similarly the code for HELICOPTER = HLCPERTOIE
- 24. The pattern is as follows: 1 2 3 4 5 6 7 8 = 1 2 3 6 4 5 8 7 R A T I O N A L = R A T N I O L A Similarly the code for 1 2 3 4 5 6 = 1 2 3 6 4 5 T R I B A L = T R I L B A
- 25. The pattern is as follows: C | R C L E = R | C E L C 1 2 3 4 5 6 = 3 2 1 6 5 4 Similarly the code for SQUARE = UQSERA





- 26. According to the above diagram  $\phi$  is third to the left of  $\beta$ .
- 27. According to the above diagram  $\beta$  is sitting to the immediate right of  $\varepsilon$ .
- 28. According to the above diagram  $\phi$  is third toward right of  $\psi$ .
- 29. According to the above diagram  $\varepsilon$  is sitting between  $\alpha$  and  $\beta$ .
- 30. According to the above diagram three of them are sitting between  $\gamma$  and  $\beta$ .
- 31. 2 is answer by observation
- 33. 2 is answer by observation
- 35. 4 is answer by observation
- 37. 2 is answer by observation
- 39. 1 is answer by observation
- 41. 1 is answer by observation
- 43. 2 is answer by observation
- 45. 2 is answer by observation
- 47. 1 is answer by observation
- 49. 4 is answer by observation
- 50. 3 is answer by observation that most closely resembles the mirror image.

- 32. 2 is answer by observation
- 34. 4 is answer by observation
- 36. 1is answer by observation
- 38. 2 is answer by observation
- 40. 2 is answer by observation
- 42. 3 is answer by observation
- 44. 2,3 is answer by observation
- 46. 2 is answer by observation
- 48. 1 is answer by observation

#### **Directions for Questions 1 to 5:**

Read the passage below and answer the questions given after it.

At this stage of civilization, when many nations are brought into close and vital contact for good and evil, it is essential, as never before, that their gross ignorance of one another should be diminished, that they should begin to understand a little of one another's historical experience and resulting mentality. It is the fault of the English to expect the people of other countries to react as they do, to political and international situations. Our genuine goodwill and good intentions are often brought to nothing, because we expect other people to be like us. This would be corrected if we knew the history, not necessarily in detail but in broad outlines, of the social and political conditions which have given to each nation its present character.

1.	According to the author 'Mentality' of a nation is mainly product of it's:					
	(A) present character	(B)	international position			
	(C) politics	(D)	history			
2	The character of a nation is the result of ite:					
۷.	(A) gross ignorance	(B)	cultural beritage			
	(C) socio-political conditions	(D)	mentality			
	(-) F	• •				
3.	The need for a greater understanding between nations:	1				
	(A) is more today than ever before	(B)	was always there			
	(C) is no longer there	(D)	will always be there			
4	Englishmen like others to react to political situations like					
	(A) others	(B)	us			
	(C) themselves	(D)	each others			
		. ,	N./			
5.	According to the author his countrymen should:		*			
	(A) read the story of other nations	(B)	not react to others' actions			
	(C) have a better understanding of other nations	(D)	have vital contacts other nations			

#### Directions for Questions 6 to 8:

7.

# Read the following passage and answer the questions given after it.

Mahatma Gandhi believed that industrialization was no answer to the problems that plague the mass of India's poor and that villagers should be taught to be self-sufficient in food, weave their own cloth from cotton and eschew the glittering prizes that the twentieth century so temptingly offers. Such an idyllic and rural paradise did not appeal to the those who inherited the reins of political power.

- 6. Mahatma Gandhi's views opposed industrialization of villages because:
  - (A) It would take away the skill of the villagers
  - (B) It would undermine self-sufficiency and destroy the beauty of life of the villagers
  - (C) It would help the poor and not the rich
  - (D) It would affect the culture of the Indians

The meaning of the glittering prizes that the twentieth century so temptingly offers is"

- (A) replacement of rural by urban interests
- (B) absence of violence and corruption
- (C) pursuit of a commercialized material culture
- (D) complete removal of poverty
- 8. The basis of 'an idyllic and rural paradise' is:
  - (A) self-sufficiency in food and clothes and simplicity of life style
  - (B) supporting those holding powerful political positions
  - (C) rapid industrialization of villages
  - (D) bringing to the villages the glittering prizes of the twentieth century

#### Directions for Questions 9 and 10:

In each of the following questions out of the given alternatives, choose the one which best expresses the meaning of the given word.

•	l la rah		
9.	Harsn (A) Disfigure	(B)	Slit
	(C) Severe	(D) (D)	Slash
10.	Tedious		Deinfel
	(A) Tresome	(B)	Paintui
	(C) Housiesome	(D)	Lengury
Direct Choos	tions for Questions 11 to 15: se the word which is the exact OPPOSIT	E of the given words.	11-1.)
11	Abet		61 76
•••	(A) Prevent	(B)	Aid
	(C) Pacify	(D)	Rush
40			1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
12.	Amused	(B)	Frightened
	(C) Saddened	(D) (D)	Astonished
	(-)	(-)	
13.	Disparage	12	1.
	(A) Please	(B)	Denigrate
	(C) Praise	(D)	Bentue
14.	Culpable	1	
	(A) Irresponsible	(B)	Careless
	(C) Defendable	(D)	Blameless
15.	Intricacy	4.2	ALL STATES
	(A) Distance	(B)	Simplicity
	(C) Cordiality	(D)	Ornate
Direct	tions for Outstians 46 to 25		6
Direct	lions for Questions 16 to 25:		
Find th	ne answer that best matches the underlin	ned word/phrase.	
16.	he disposed of the old materials.		
	(A) tell away	(B)	threw away
	(C) went away	(D)	cutaway
17.	Please submit your application before t	wo o'clock.	
	(A) hand in	(B)	hand down
-92.,	(C) hand off	(D)	hand out
18.	Rahul and Jassi are friendly with each of	other.	
(	(A) get by with	(B)	get along with
1	(C) get over with	(D)	get through with
10	Were you able to receiver your stelen la	inton?	
19.	(A) get back	(B)	reach back
	(C) go back	(D)	come back
		(-)	-
20.	Someone illegally entered the warehou	se last night.	
	(A) broke away	(B)	saw through
	(C) Saw IIIC	(D)	
21.	After stopping at Bombay, the ship trav	elled towards Cochin.	
	(A) made to	(B)	passed up
	(C) went over	(D)	headed for www.examrace.com

22. Mr. Sethi was hit by a car yesterday on his way to work.

	(C) run over	(D) run (	out
23.	Please read the instructions carefully before starting the (A) watch out (C) let down	vork. (B) loop (D) go tł	o up hrough
24.	Yamini resembles her mother more than her father. (A) takes after (C) looks after	(B) goes (D) calls	s after s after
25.	Babu's secretary interrupted to tell him he had a telephon (A) cut out (C) took in	e call. (B) cut i (D) took	in cout
Direct Of the	ions for Questions 26 to 30: four alternatives given under each sentence, find the one	that best	fits into the blank space.
26.	It to me that she was incurable. (A) suggested (C) happened	(B) flash (D) occu	hed urred
27.	I am feeling better today. (A) too (C) very	(B) rath (D) fairly	ier y
28.	(A) Besides (C) Despite	(B) Acce (D) Barr	epting ring
29.	The Sun at six this morning. (A) arose (C) aroused	(B) rose (D) raise	e ed
30.	Health is too important to be (A) neglected (C) despised	(B) dete (D) disca	ested carded

#### Directions for Questions 31 to 35:

In the following passage, there are some numbered blanks. Fill in the blanks by selecting the most appropriate word for each blank from the given options:

Do women exercise leadership differently from which men do? And if so, will feminine leadership.....(31)..... where masculine leadership does not? A recent study suggests somewhat paradoxically that female managers.....(32)..... their male counterparts even when the personal characteristics are very similar. Of the two schools of thought, the structuralist theory argues that men and women do not receive the same treatment in the workspace and that stamping out..... (33).... Bias would stamp out the observed .....(34)..... In contrast the socialization theory contends that men and women experience work as more .....(35)... to their lives.

31.	<ul><li>(A) Affect</li><li>(C) Compete</li></ul>	<ul><li>(B) Succeed</li><li>(D) Progress</li></ul>
32.	<ul><li>(A) Out live</li><li>(C) Out stand</li></ul>	<ul><li>(B) Out come</li><li>(D) Out work</li></ul>
33.	<ul><li>(A) Employment</li><li>(C) Gender</li></ul>	(B) Culture (D) Class

- 34. (A) Variations (C) Resemblances
- 35. (A) Central (C) Trivial

# Directions for Questions 36 to 40:

Select the meaning of the given phrases/idioms.

- 36. At one's wit's end
  - (A) Perplexed
  - (C) Explain
- At one's fingertips 37.
  - (A) To take revenge
  - (C) Complete knowledge
- At the spur of the moment 38.
  - (A) Difficult Moment
    - (C) Great Moment
- 39. All in all
  - (A) Every person
    - (C) Call all at once
- 40. At close quarters
  - (A) Close examinations
  - (C) Live far to each other

- (B) Discriminations
- (D) Distortions
- (B) Preliminary
- (D) Needy
- (B) Clear up (D) Enlighten
- (B) Matter of shame
- (D) None of the above
- (B) Without Delay (D) Very Slow
- (B) Particular thing same in all Most important (D)
- (B) Live near to each other
- (D) In love

ANSWERS (English)

1.	А	2.	В	3.	А	4.	. (	0	5.	A
6.	В	7.	С	8.	А	9.	). (	C	10.	A
11.	A	12.	С	13.	С	14	4. <i>A</i>	Ą	15.	В
16.	В	17.	А	18.	В	19	9. A	Ą	20.	D 14
21.	D	22.	С	23.	D	24	24. E	3	25.	в 📢 🕴
26.	D	27.	D	28.	С	29	29. E	3	30.	A (,)
31.	В	32.	D	33.	С	34	64. E	3	35.	A
36.	A	37.	С	38.	А	39	9. A	4 44	40.	A
								100	20	